# UBS TOKEN

## Modelled Outcomes

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# Introduction

The Federal Reserve publishes their dataset for the US economy on their website for use in their FRB/US Dynamic Stochastic General Equilibrium model here: https://www.federalreserve.gov/econres/us-models-python.htm

I have isolated the variables from this dataset that I wish to study with a view to assessing the impact of the UBS token on the economy in terms of inflation, GDP growth and consumption as household disposable income rises due to issuance of the token.

In the Excel model provided in my repository, the average monthly token value paid out to each citizen over the two year span modelled throughout a period of low and inflation and a period of high inflation equates to $107.61. I therefore sought to find a relevant period within the historical data where each household received a universal increase in their disposable income that equated to this value.

The COVID stimulus checks provided during the pandemic were universally granted to households and the total value of the round where there was no longer a lockdown and the impact could therefore be estimated was $401bn. The total cost of the UBS token per year averages $279bn – therefore a factor of 0.7 can be used against each impact.

Whilst more in-depth modelling will be produced in the future using the FRB/US DSGE, this research serves to demonstrate the high-level impact of boosting household disposable income on inflation, GDP and consumption. The outcomes below reveal that the token can have a significant positive overall effect for the economy and highlight the need for further research through DSGE modelling.

# Variables

## Real household disposable income - YDN

In the five years previous to the pandemic, the average quarterly increase in YDN was 159.57. The third stimulus check added 2150.3 to it. Therefore if you subtract 159.57 from 2150.3, apply the 0.7 factor and spread it over 4 quarters you can add 348.38 to each quarter to simulate the token impact on disposable income.

## Personal consumption – ECNIA

In the five years previous to the pandemic, the average quarterly increase in ECNIA was 76.53. The third stimulus check increased consumption up by 340.12 in the following quarter, 386.93 in the quarter after that, 100.7 in the quarter after that and 107.12 after that before consumption returned to par levels. Therefore if you multiply 76.53 by 4 and subtract that from the sum of the increased consumption figures aforementioned multiplied by 0.7 you can add 87.07 to each quarter to simulate the token impact on consumption.

## Consumption – ECO

In the five years previous to the pandemic, the average quarterly increase in ECO was 53.5. The third stimulus check increased consumption up by 174.5 in the following quarter, 330.6 in the quarter after that, 203.2 in the quarter after that and 78.5 after that before consumption returned to par levels. Therefore if you multiply 53.5 by 4 and subtract that from the sum of the increased consumption figures aforementioned multiplied by 0.7 you can add 85 to each quarter to simulate the token impact on consumption.

## 10 year Treasury bond rate – RG10

As money will be created to fund the token, the average bond rate during the pandemic can be applied to the forecasts as the increased supply will be a downward pressure on rates. This was 1.1 during 2020 and 2021.

## Personal saving rate – RSPNIA

The personal saving rate average 10.825 during 2021 so after applying a factor of 0.7, this is 7.58.

## FRB/US DSGE Model

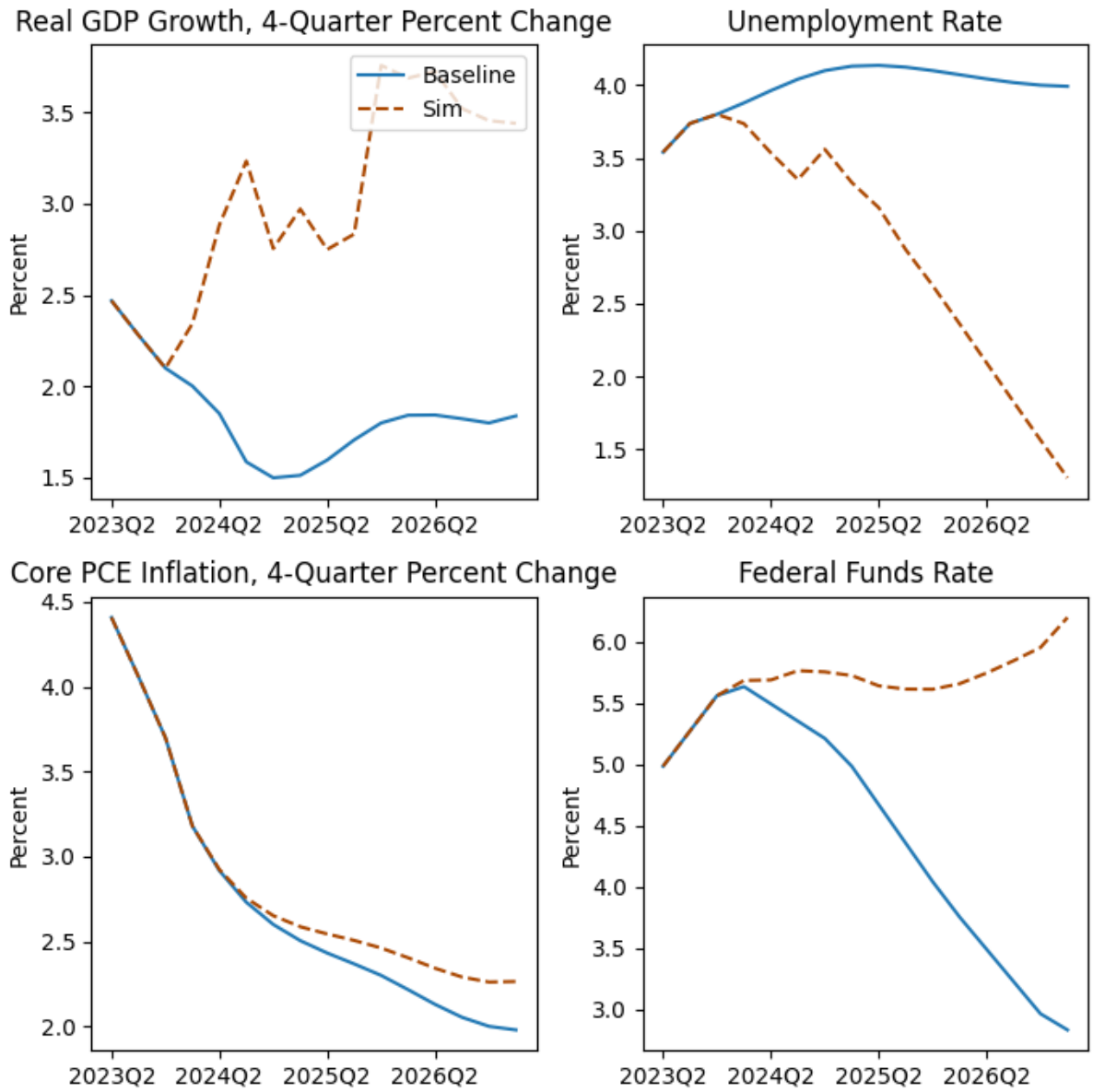
```
import pandas
from numpy import array, cumprod

from pyfrbus.frbus import Frbus
from pyfrbus.sim_lib import sim_plot
from pyfrbus.load_data import load_data


# Load data
data = load_data("../data/LONGBASE.TXT")

# Load model
frbus = Frbus("../models/model.xml")

# Specify dates
start = pandas.Period("2024Q1")
end = "2027Q1"

# Standard configuration, use surplus ratio targeting
data.loc[start:end, "dfpdbt"] = 0
data.loc[start:end, "dfpsrp"] = 1

# Solve to baseline with adds
with_adds = frbus.init_trac(start, end, data)

# Scenario based on 2021Q3 Survey of Professional Forecasters
with_adds.loc[start:end, "lurnat"] = 3.78

# Set up trajectories for mcontrol
with_adds.loc[start:end, "rg10_t"] = [1.1, 1.1, 1.1, 1.1, 1.1, 1.1, 1.1, 1.1,
1.1, 1.1, 1.1, 1.1, 1.1]
with_adds.loc[start:end, "eco_t"] = [10811, 10996, 11168, 11336, 11502,
11667,11831,11992,12150,12304,12455,12605,12759]
with_adds.loc[start:end, "ydn_t"] = [21139, 21377, 21585, 21777, 21964, 22149,
22331, 22510, 22684, 22854, 23023, 23197, 23386]
with_adds.loc[start:end, "ecnia_t"] = [14730, 14895, 15057, 14956, 15121,
15291, 15462, 15635, 15807, 15977, 16146, 16314, 16490]
with_adds.loc[start:end, "rspnia_t"] = [7.58, 7.58, 7.58, 7.58, 7.58, 7.58,
7.58, 7.58, 7.58, 7.58, 7.58, 7.58, 7.58]

# Get GDP level as accumulated growth from initial period
gdp_growth = cumprod((array([1.6, 1.4, 1.4, 1.5, 1.6, 1.8, 1.8, 1.8, 1.8,
1.78, 1.76, 1.76, 1.97]) / 100 + 1) ** 0.25)
with_adds.loc[start:end, "xgdp_t"] = with_adds.loc[start - 1, "xgdp"] *
gdp_growth
```

```
targ = ["xgdp", "eco", "rg10", "ydn", "ecnia", "rspnia"]
traj = ["xgdp_t", "eco_t", "rg10_t", "ydn_t", "ecnia_t", "rspnia_t"]
inst = ["eco_aerr", "eco_aerr", "rg10_aerr", "ydn_aerr", "ecnia_aerr",
"rspnia_aerr"]

# Run mcontrol
sim = frbus.mcontrol(start, end, with_adds, targ, traj, inst)

# View results
sim_plot(with_adds, sim, start, end)
```

The above code is then run in Python whereby all historical data pre-2024 is untouched and the variables values as defined above are added to all rows in 2024-2026 for ECNIA, ECO, RG10, RSPNIA and YDN.

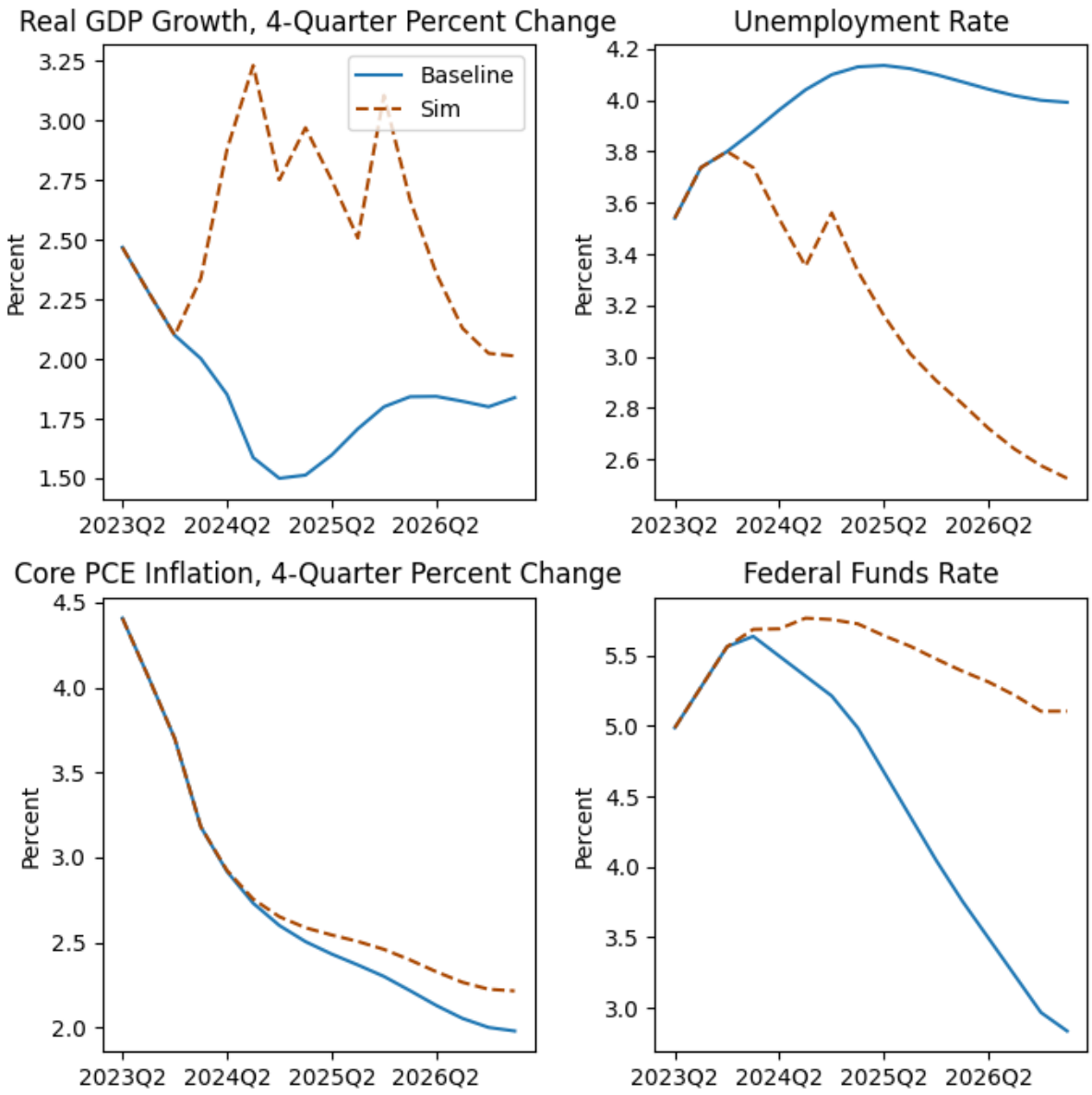
## Scenarios and Outcomes

A token is issued each month to every citizen throughout 2024 to 2026




Under the current baseline simulation provided by the Federal Reserve, the average net real gain of GDP is -0.58% per quarter should nothing change. If the token was issued, the average net real gain of GDP per quarter would be 0.84% based on subtracting PICXFE (inflation rate) from HGGDP (GDP growth rate).

A token is issued that is directed to a savings wallet rather than a disposable wallet should GDP growth rates exceed 3% through 2024 to 2026




Under the current baseline simulation provided by the Federal Reserve, the average net real gain of GDP is -0.58% per quarter should nothing change. If the token was issued, the average net real gain of GDP per quarter would be 0.18% based on subtracting PICXFE (inflation rate) from HGGDP (GDP growth rate).